

**- PEG -**

## Switching power supply SP-R

### Operating instructions



**2010**

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# Safety Instructions

## Special symbols



Touching the electrical equipment may be fatal



Warning, read operating instructions



Warning, battery



Do not disposed together with domestic waste

## Safety instruction and commands



1. Only authorized and informed person can work on this device
2. Earth the device properly
3. Disconnect all wiring before any manipulation
4. Do not unplug any connector under voltage

# Introduction

Switching chargers of the SP-R series are intended for charging station batteries of nominal voltage 110V and 220V.

Chargers are suitable for supplying DC circuits with combination of charging station batteries. Switching chargers of the SP-R series fully comply with the requirements of the station battery charging standard EUROBAT.

Power supply unit offers function of temperature compensation of charging voltage, inputs wiring resistance measurement or fast charging. Different charging characteristics can be used-  $I_{U_0}$ ,  $I_{UU_0}$  etc.

# Description

The power unit is fit into 3U 19" rack and is designed for built-in mount into switchgears. All connection and signalling points are situated in front panel.

Compact construction of the charger brings all advantage of switching units in comparison with standard power supply units equipped with transformer – primarily lower weight and smaller dimensions. Advanced software equipment leads to higher user comfort and to the merging different measure devices into one device.

Nominal output current is 50A for voltage 110V DC and 25A for voltage 220V DC. In case of need up to 16 power units can be set together in parallel operation mode, with possibility of changeover of wrong module during operation without blackout. Output voltage fuses are placed in rear panel.

The power unit has force cooling which is controlled according to momentary temperature of the cooler. This solution increases lifetime of ventilator and contributes to low-noise run of the unit.

Regulation is controlled by processor card ProDrive III equipped DSP processor Texas Instruments.

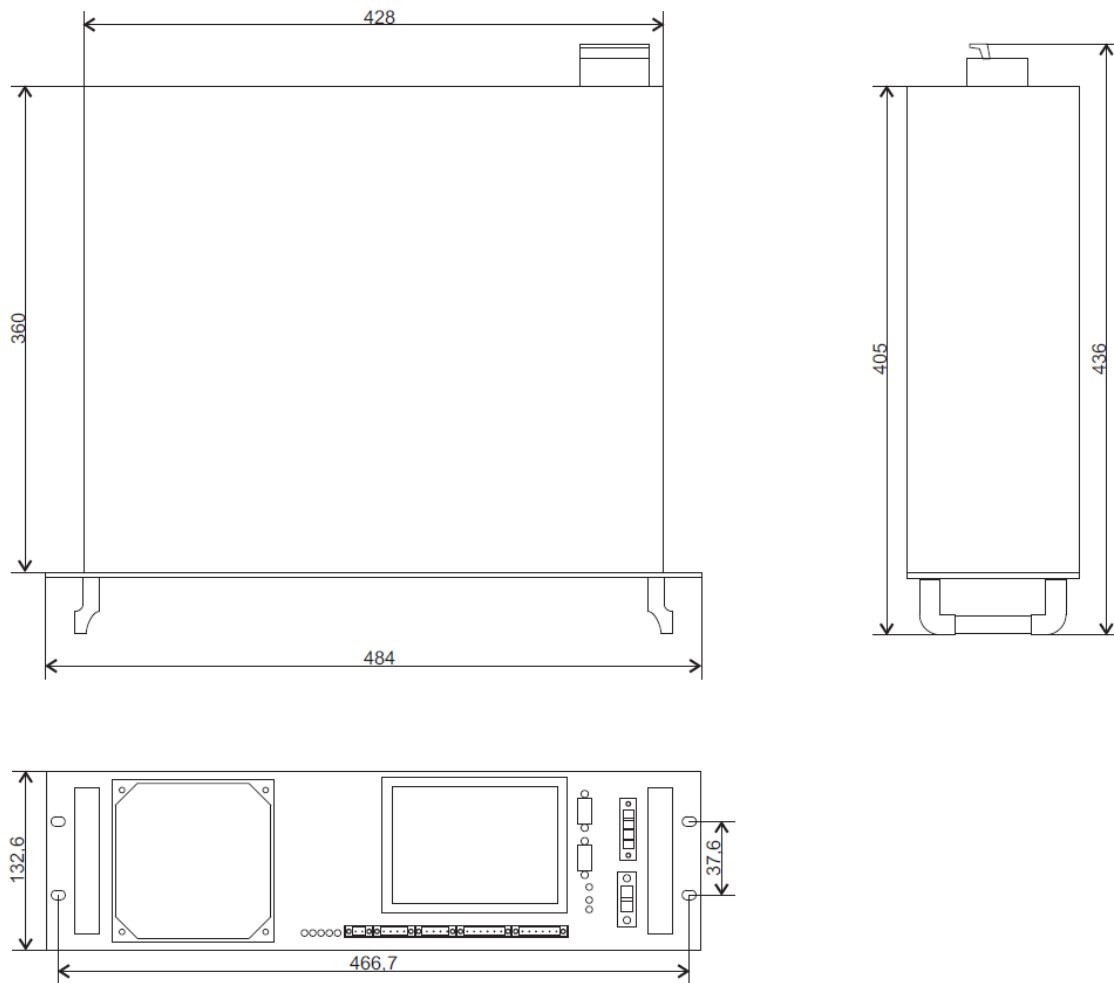
Processor control with combination of power electronics elements temperature measurement allows short-term operation by reducing output current as well during deterioration of temperature conditions.

The unit can be equipped by 3" HMI colour LCD panel. The HMI panel can be fit in switchboard as well.

## Type code

-PEG- xx/xx SP-R

nominal voltage		
nominal current		
switching charger		



**Picture 1 Dimensions SP-R with LCD panel**

# Parameters

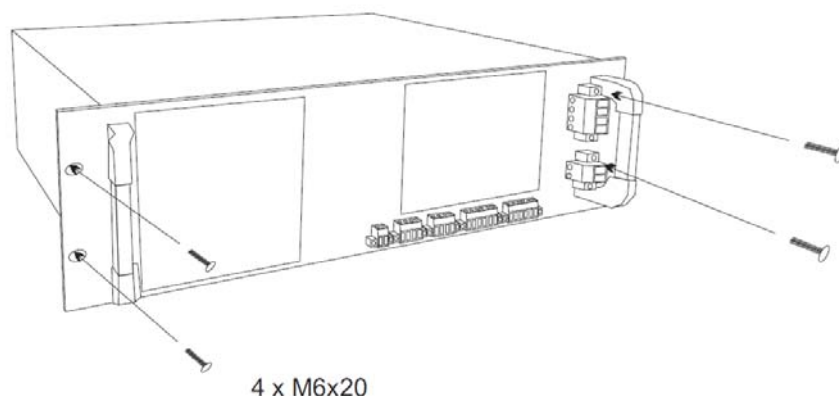
Basic types		
U <sub>in</sub>	3x 400/230 V	
I <sub>in</sub>	16A	
f <sub>in</sub>	30-70 Hz	
U <sub>n</sub>	110 V DC	220 V DC
I <sub>max</sub>	50A	25A
Current ripple	<3%	
Efficiency	92 - 95%	
Power factor	0,98	
Parallel operation	YES	
Short circuit protection	YES	
LCD	YES	
Temperature compensation	YES	
Fast charging	YES	
Communication	RS232, RS485	
Logical inputs	2	
Analog inputs	1	
Logical outputs	9 (230 V AC/5 A)	
Operational temperature	-25 to +40 °C	
Dimension	360 x 484 x 133 mm	
Weight	25 kg	
Protection	IP 20	
Options		
PT100/PT1000		
3,5" HMI		
Load current measurement		

Table 1 Parameters

# Installation

## Mechanical mounting

The power unit is fit into 3U 19`` rack and is designed for built-in mount into switchgears. The unit is necessary to mount into factory made support panel or into corresponding device. The unit is fixed by four screw-bolts M6 going throw front panel (picture 2). Mounting dimensions including mounting holes dimension are shown on picture 1.



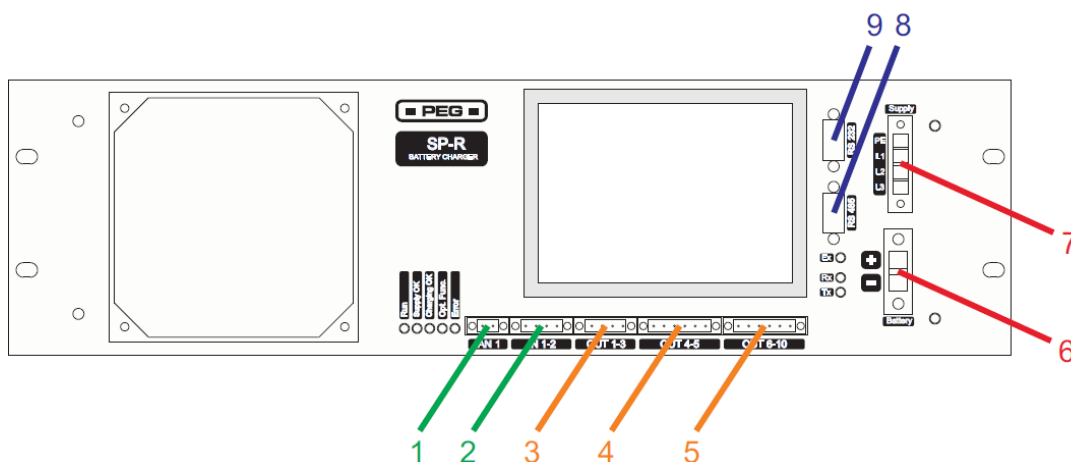
Picture 2 Mounting

The unit has to be mounted only in horizontal position. Sufficient room for inflow and outlet of cooling air is necessary – 50mm in front of unit, 100mm at back of unit. The surrounding temperature must be in range from -25°C to +40°C, otherwise right function can not be warrant.

## Electrical wiring

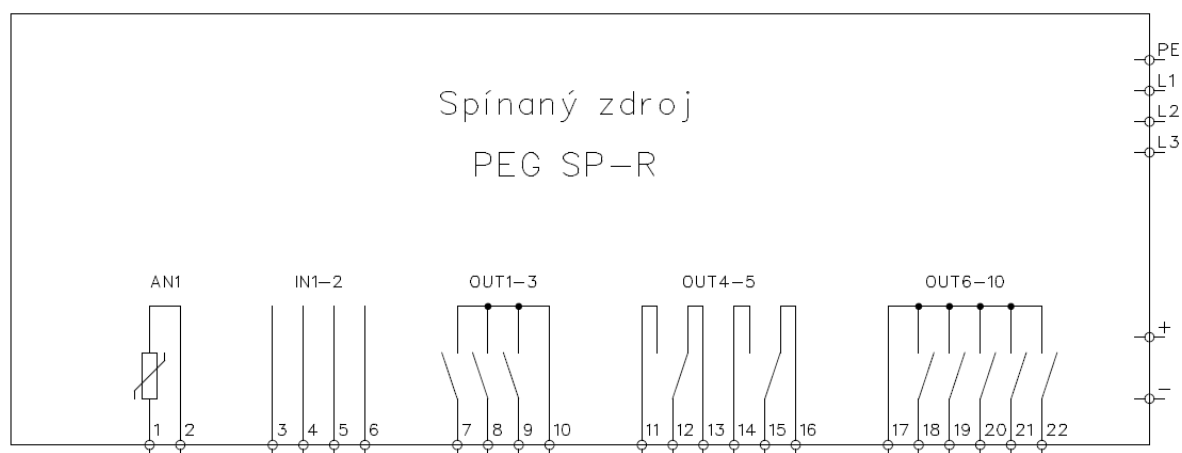


All connection and signalling points are situated in front panel.



Picture 3 Connectors





**Picture 4 Connector wiring**

	Function	Voltage
<b>Connector 1</b>	PT100/PT1000	
<b>Connector 2</b>	2 digital inputs	internal 24 V DC or external 110/220 V DC (set by manufacturer)
<b>Connector 3</b>	3 logical outputs; relay with common pin	230 V AC / 5 A 48 V DC / 5A
<b>Connector 4</b>	2 logical outputs; relay with common pin	230 V AC / 5 A 48 V DC / 5A
	external display supply	24 V DC (set by manufacturer)
<b>Connector 5</b>	5 logical outputs; relay with common pin	230 V AC / 5 A 48 V DC / 5A
<b>Connector 6</b>	Battery output	110 V/220 V DC (set by unit type)
<b>Connector 7</b>	Supply voltage	3x400/220V AC + PE
<b>Connector 8</b>	Communication port RS 485	
<b>Connector 9</b>	Communication port RS 232	

**Table 2 Connectors**

In case of external HMI panel mounting is necessary to connect port RS232 with the charger and provide power supply 24V DC for HMI panel. For the power supply connector 4 (OUT 5) can be used, terminals 14 (+) and 16 (-). This possibility has to be set by manufacturer.



The isolation of the wires plugged into connectors despatch only in needed length, touchable bare wiring is not allowable

Screw-terminals of connectors 1-5 are to be tightening by torque 0,5Nm, connector 6 by torque 1,5Nm and connector 7 by torque 2Nm.



Earth wire on terminal PE in connector 7 must be plug-in properly.

## Battery connection



The inputs wiring resistance can be measured before battery plug-in. For this measurement, battery supply wiring is unplugged on battery, the wiring is connected (charger far end) and the charger provide resistance measurement. The measurement is release by switching input IN2 (function "Start of resistance measurement"). Charger works with the result of measurement and the output voltage is adjusted which means, charger compensate resistance of supply wiring.

After measurement the battery can be plug-in, it is necessary to observe the procedure recommended by producer of batteries.



The function for wiring resistance measurement is optional, not all chargers can provide it. Before application of this function consult the possibility with manufacturer.



Observe the right battery polarity!

Only battery with nominal voltage the same as nominal output voltage of charger can be connected.

# Settings

Inputs and outputs are programmable which means adjustment of the power unit to concrete application. For each input and output one or up to all switching possibilities can be set (see table 3). Voltage and current of individual inputs and outputs are mentioned in chapter “Installation”, table 2.

Each input and output can be logically inverted.

<b>IN</b>	External failure	Charger shutdown
	Fast charging start	
	Resistance measurement start	
	ON/OFF	
	Siren silence	

<b>OUT</b>	<b>Charger failure</b>	Power supply loss	Unit supplied from DC
		Over voltage	Unit supplied from DC
		Under voltage	Unit supplied from DC
		Fusses	
		Summary fault	
		Over current	
	<b>Battery diagnostics</b>	Battery over voltage	Charger shutdown
		Battery not charged	
		30% capacity left	
		10% capacity left	
		Battery discharged	Battery unfasten
		Charging with higher voltage	
		Charging with lower voltage	
		Run	
		Siren	

**Table 3 Inputs and outputs**

# Operation

## Operation states signalling

The unit can be equipped with HMI LCD panel which is used for settings and for signalling of operation states or fault reports.

All units are equipped with set of LED diodes for signalling of basic operation states.

LED diode	Meaning
RUN	Operation, without faults
Supply OK	Power supply 400V is present
Charging OK	Charging voltage in tolerance
Opt. Func.	Optional function is active
Error	Unit failure or fault

## LCD display function

LED diode signalling is active as well in units with LCD panel. The panel can be mounting in switchgear or on other places far from charger rack (central control board etc.).

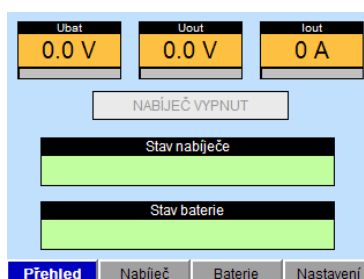
There are four basic schemes available on the HMI display; buttons on panel screen bottom are used for changes.



The panel is control by touching on selected point, is strictly forbidden to use objects which could damage the screen (sharp object, screw-driver etc.).

## Overview

Basic screen for fast diagnostics. Text description is shown as well as measured value of charger, battery and output voltage.

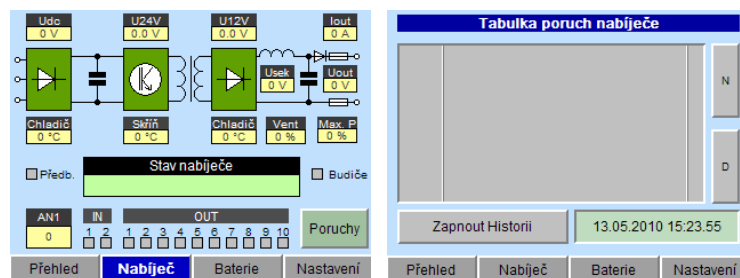


## Charger

Screen serves detailed information about charger inner electrical values, temperatures of components and about actual status of all inputs and outputs.

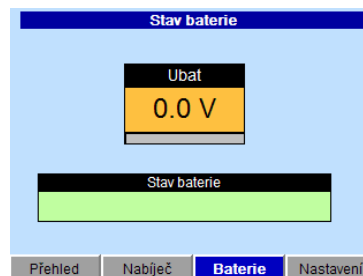
The list of error-states could be invoked from the screen by pressing button “Errors”.

Error history is available from the screen by pressing “History on”, for return to on-line mode button “History off” is used.



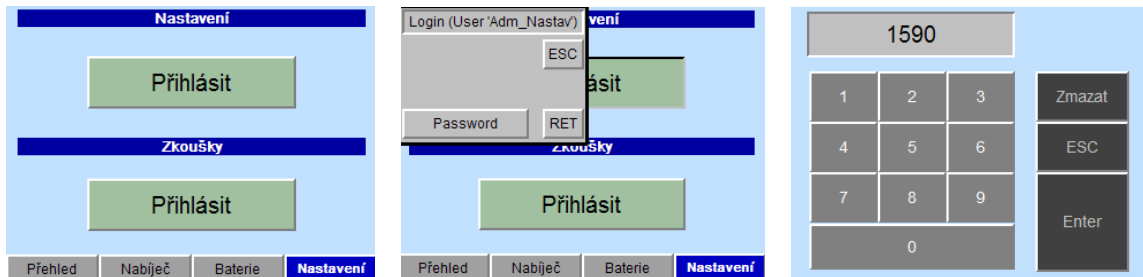
## Battery

Actual status of battery is shown, in text description and as a measured value of battery voltage.



## Settings

Screen is used for function setting of individual inputs and outputs and for setting of other operation parameters.



Password is necessary for entering – 1590. Press the button „Password“ for enter, insert the password and confirm by pressing „Enter“ and „RET“. For return without password insert press the button “ESC”. Last insert number can be deleting by pressing “Clear”.



Settings mode is used for setting inner values necessary for unit correct operation. It is strictly forbidden to change inner parameters without consulting with the manufacturer.



Test mode is used for unit service setting and is strictly forbidden to use this mode without consulting with the manufacturer.

## Error summary

Errors are announced on unit screen and by acoustic siren.

# Maintenance

The device does not need any regular maintenance. The regular maintenance according to valid norms ČSN-EN – electro technical devices has to perform. This maintenance consists of visual control of the device, cleaning the device (best is via vacuum cleaner) and of control of proper tighten of screw joints.

This maintenance has to be performed in terms according to status of surroundings, but maximum 6 months duration.

# Service and service assistance

In case of queries or problems with the device contact the producer:

PEG spol. s r.o., Baarova 49, 140 00 Prague 4

Plant Kolbenova 922/5a, 190 00 Prague 9

[www.peg.cz](http://www.peg.cz)

[peg@peg.cz](mailto:peg@peg.cz)

Tel: 281 087 521, fax: 281 087 522

GSM O<sub>2</sub>: 724 366 435, T-mob: 731 118 119

Please, let us know about these details:

- Serial number of charger
- Date of first failure
- Failure description



## Guarantee terms

Guarantee for material failure, construction failure and treatment and machining failure is provided for the devices, duration 24 months. The guarantee could be prolonged only via contract.

Producer is not responsible for any damage caused by wrong mounting; wrong operating conditions, settings change or any other conditions which are not in accordance with documentation. Producer is not responsible for consequences of wrong usage.

Producer of monitor reserves the right to change technical data specification and details without former notice.